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## MEMORANDUM

TO: Susan Edmiston  
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**HSM-03001**

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SUBJECT: SACRAMENTO, SAN JOAQUIN, STANISLAUS, AND YOLO COUNTIES  
SCOUT ACTIVITY PROFILE

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The term "scouting" applies to any agricultural field inspection activities conducted to evaluate plant vigor, crop maturity, pest and disease pressures, and pesticide treatment efficacy. The federal Worker Protection Standard (WPS) and California Code of Regulations (3 CCR) permit scouts to enter fields that are under a restricted entry interval (REI), provided they have been trained as pesticide handlers and that they wear the PPE stipulated for early entry workers. The exemption for early entry to conduct scouting tasks was adopted because it is sometimes necessary that the crop status or pesticide treatment efficacy be evaluated prior to the expiration of the REI and because only a brief time is generally required to make an assessment. While the potential for over-exposure to pesticide residues exists, only one pesticide-related illness associated with scouting tasks has been reported to California's Pesticide Illness Surveillance Program (PISP) since 1995.

Toxicologists conducting risk assessments of pesticides have relied on default exposure estimates for scouts because their activities have not been well-characterized. This document summarizes approximately 30 hours' of interviews and observations of 14 workers engaged in scouting activities during August and September 2002. Scouting activities were conducted in Sacramento, San Joaquin, Stanislaus and Yolo counties. Additional information about scouting activities in California will be gathered for project 0202 (Scout Activities Observation Study) and a full study report will be prepared. This information will hopefully provide guidance for DPR risk assessors and others.

In this region, scouting activities are conducted predominantly by pest control advisors (PCAs) working full-time, year-round as sales representatives for agricultural chemical sales and service companies such as Western Farm Service, John Taylor/Wilbur Ellis, Helena Chemical Company, and the like. The companies' business platform is fertilizer and pesticide sales and application services and plant and soil nutrient analyses. While the regulations consider "scouts" to be anyone who enters fields to make assessments, the term as used in agriculture refers to seasonal, full-time workers who assist the PCAs during the peak period of crop maturation to evaluate insect, fungus and disease pressures. Scouts are



the PCA's extra eyes during the busy summer months and their work is limited to making observations of plant and crop status.

PCAs are college-educated and possess a PCA license, while seasonal scouts are typically college students who may have little or no agricultural experience. PCAs routinely meet with growers to discuss their crops' status and to make recommendations about pesticide treatments to best achieve the growers' goals for the season. Their primary role is balancing insect and disease pressures vs. economic pressures. Scouts have little contact with the growers and do not make any recommendations concerning pesticide treatments.

With the exception of sweet corn, which is heavily treated on a schedule in the weeks preceding harvest, crops are treated on an "as needed" basis. PCAs recommend the least toxic pesticides be applied at the lowest effective rates and as infrequently as possible in order to maintain the beneficial insect populations as well as to save the grower money. If the market value of a crop is low for a given year, the grower will tolerate a higher level of insect and disease pressures in order to turn a profit. Other factors, which determine whether fields are treated and what pesticides are used, include quality standards set by packing houses, processors, and co-ops. In the approximately 40 fields I observed, about 30% had not been treated during the season. Another 30 - 35% had been treated once, in mid-summer. The remaining 30 - 35% had received a variety of treatments during the season. During my observations, sweet corn was the only crop that PCAs (but NOT scouts) entered during an REI, and it was the only crop that was posted during their entry.

PCAs are highly knowledgeable about the potential effects of over-exposure to pesticides and are conscientious about limiting both their potential exposure to pesticide residues and reducing the impact of unavoidable exposures. Since the PCAs make the pesticide recommendations, they are fully aware of when fields are treated. When feasible, which is probably more than 80% of the time, PCAs schedule inspections around the applications and avoid entering fields that are under an REI. Seasonal scouts work directly under the PCAs' supervision and receive their work orders from the PCAs on a daily basis. All the PCAs interviewed stated that they never schedule scouts to enter fields that are under an REI. While PCAs reported that they always inform scouts of pesticide treatment and REIs, seasonal scouts varied in their awareness of pesticide applications and timing. However, all seasonal scouts reported that they do not enter fields during an REI.

Observations and interviews were conducted in August and September at four agricultural chemical companies. Each company employs 4 - 12 full-time, year-round PCAs or scouts (2 females among all of these employees at the 4 companies) and 2 - 4 seasonal scouts (all male). Most seasonal scouts work for about 3 months each year; a few work 6 months. Most typically, a PCA has a single scout assigned to them for the season. This information can be used to estimate that approximately 25% - 50% of the scouting workforce works seasonally,

while 50% - 75% works year-round. The PCAs interviewed had between 5 - 40 years' experience, with an average of 5 - 15 years'. The seasonal scouts had 0 - 3 years' experience.

The types of scouting tasks vary widely, depending on the PCAs' sales territory and the particular growing region. In this region, scouting activities take place in 20 crops, representing tree fruits, nuts, grapes, row crop, and forage/fodder crops.

#### Scouting Work Schedules

- From April through October, full-time PCAs/scouts are in the fields most of the day and work 5.5 - 6 days a week, 8 - 12 hours a day, averaging 50-72 hours per week.
- From October - March, the year-round PCAs/scouts work 40- 60 hours per week. Seasonal scouts typically work 8 - 10 hours a day, 5 - 6 days a week for 3 months per year. Seasonal scouts typically have lower exposure potential than do permanent PCAs/scouts. Some work full-time in tasks which never require them to enter fields.
- Time spent in the field vs. driving ranges from 30 - 75% of the day. Fields vary in size from 25 acres to several hundred acres. Some days the fields are within a short distance of each other while other days require driving 10 - 30 miles between fields. Fields require differing levels of inspection both by crop and time of season. The PCAs interviewed estimated their time spent in the field in various ways:
  - total hours,
  - % of work day,
  - number of acres covered per day (300 - 1,000) or week, or
  - number of total fields (6-12 per day) and stops per week (one scout reported 155 stops in 70 fields) .
- The peak time for field activities is mid-May to mid-August, when scouts are in the fields between 75 - 95% of the day. From mid-August - October, the work slows down, and the time in the field drops to about 50% of their day. Approximately 1 hour each day is spent in the office.

#### Characterizing Scouting Tasks

PCAs/scouts may focus on one or a few crops or evaluate as many as 15 - 20 crops. Two of the four companies interviewed assign seasonal scouts to only collect soil samples in fallow fields, collect petiole samples, and check/re-bait pheromone traps. In general, when a variety of crops are present in the PCA's territory, the PCA will evaluate all of them, while seasonal scouts typically focus on only a few crops, often only one or two.

In general, row crops take less time to inspect than do permanent crops and the higher value crop fields (vegetables, nuts, fruit) are inspected more thoroughly and frequently than lower value fields, such as alfalfa and field corn. Permanent crops are inspected an average of 1 - 4

times per month until leaf fall, then checked once per month afterward for nutrition and general vigor and/or weeds and diseases. Row crops are inspected 1 - 4 times per month from May – harvest. A greater portion of visual inspection takes place from Sept. – March/April, and a greater portion of hands-on inspection takes place during summer months. Most crops are sampled for plant nutrition evaluations. Samples consist of leaves, petioles, and/or hulls. Soil samples are also frequently collected.

The majority of scouting work consists of walking the fields, evaluating the crop visually, and occasionally hand-inspecting and/or sampling individual leaves, fruit or petioles. PCAs and scouts generally check known "hot spots" first, then either walk portions of the field in loops or quadrants, or walk the whole field. In general, PCAs devote more time to walking the fields than do scouts, who typically do more spot checking. At a minimum, scouts and PCAs inspect each field at two to four spots, walking a large portion of the area surrounding each point of entry. They walk the entire field at critical stages of maturity and/or pest pressures. Both PCAs and scouts walk a greater portion of the fields in the summer months than at other times of the year.

PCAs evaluate all pressures simultaneously, but are looking for specific problems at certain times of year or crop growth stage. Scouts are trained to look only for specific pest/predator combinations. They may evaluate the extent of pressures subjectively (high, medium, low) or quantitatively by insect counts. If scouts identify a significant pest pressure, the field is always re-inspected by a PCA before he writes a recommendation for treatment. Apparently, scouting in some areas does take place by driving ATVs through vineyards and orchards, but I did not observe this practice. Scouts and PCAs conduct routine crop inspections of the following types:

- Growth stage checks are conducted to assess the maturity of the crop, which is generally expressed as % maturity. Each point of field entry takes approximately 5 minutes to inspect.
- Checking for insect hatches takes about 20 minutes at each site. The foliage is closely examined by hand, sometimes using a hand lens. Insects and egg masses are often counted and recorded. Other techniques are employed depending on the crop and include taking sweeps with a collection net (pumpkin, alfalfa), and lifting and shaking low-lying plants (tomatoes, watermelons) to dislodge insects. The latter practice often entails capturing the dislodged insects on a tray to facilitate accurate identification and counts.
- Checking for disease and fungus pressures is also conducted by visual and hand examination of the fruit and foliage, but does not involve sweeping, lifting or shaking. Each site takes about twenty minutes to inspect.
- Checking for weed pressures requires considerably less time than disease, fungus and insect checks. For seasonal crops, weeds pressures are greatest from planting until the

crop is established. For both seasonal and permanent crops, weed pressures during the summer are generally assessed simultaneously with disease, fungus and insect pressures.

- Growers using biologically integrated orchard systems (BIOS), integrated pest management (IPM) programs, pheromone disruptors and organic programs focus on the reduced use of pesticides and/or fertilizers. Because the chemical tools available for these programs are limited and their mode of action is generally selective rather than broad spectrum, the timing of treatments is critical in controlling the pest or disease pressure. Thus, these systems often require scouts and PCAs to conduct more frequent and more thorough inspections than are required for conventional agricultural systems.
- Insect trapping (pheromone) is done in most crops, either in the tree or on a stake in row crops, at a height of 5-8 feet from the ground. Trap checks take about 15 minutes per field or orchard.

#### Seasonal Variation in Scouting Tasks

- Scouts and PCAs check for weeds and disease problems in the early season, Feb. - April. Scouts' busy time starts in April, with inspections for disease pressures taking place through June. Grapes and tree fruits are inspected more closely than row crops in the early season, especially during critical periods such as bud break, blossom, shot stage, berry break, and cluster formation.
- Insect pressures typically emerge from May – August and overall scouting activity peaks June – August when they visit their fields every week – 10 days. During the fall and through dormancy, post-harvest inspections of permanent crops are conducted to check nutrition and disease status.
- Field checks of the same field and crop may take as little as 5 - 15 minutes during October – April, and as much as an hour in June – August, with an average per field in the summer of 15 - 30 minutes. For seasonal row crops, early season inspections are primarily visual, until the foliage is mature and fruit has set.
- Fall-winter - Scouts conduct soil sampling during the fall and winter months, in both permanent crops and fallow fields. Forage mix crops generally are inspected only 1-2 times per season, in winter. Orchards are inspected for scale, disease and weeds.

### Alfalfa

Crop is grown in a 4-year rotation and is cut 6-7 times per year. Pest pressures are often tolerated because market value is often low.

Inspection Season	March, July-Sept
Frequency	7-10 x per year, irregularly
Inspection duration/field	10-15 minutes
Fields per day inspected	A few
Inspection Tasks	Visual, check traps, walk only portions of the fields, use sweep nets on occasion, take samples of the middle third of the stem on occasion. Weed checks occupy 20-25% of the inspections.
% time in field with foliar contact to body region	100% contact with lower leg between ankle to knee, depending on how recently crop was cut. Very limited hand contact, 5-10%
Typical pesticides	In a ten-year period, alfalfa is generally treated only twice, using any of the following: cyfluthrin, phosmet, carbofuran, and cyhalothrin.
Typical pests	Weevil in spring; aphid, worms, lygus, disease in summer

### Green Beans

Inspection Season	May – Oct. Plantings are staggered throughout season.
Frequency	Weekly
Inspection duration/field	15-30 min
Fields per day inspected	2-4
Inspection Tasks	Visual and hand inspection, may use sweep nets or beat trays to count insects
% time in field with foliar contact to body region	Lower leg contact is approximately 50% of the time. Hand contact varies – some scouts do sweeps only with no hand contact, others hand inspect with hands and forearm contact up to 25% of the time.
Typical pesticides	Dimethoate, naled
Typical pests	Pythium (soil-borne disease), mites, leaf miner, armyworm

Field Corn – 1-3 inspections until crop is 3 feet tall, then it is not inspected again.

Sweet Corn

Inspection Season	Feb. – Oct. if two crops grown. First silk to silk dry and pre-harvest are most intensive inspection periods.
Frequency	2-4 x per month early season, weekly or more frequently near harvest.
Inspection duration/field	20-45 min
Fields per day inspected	6-10
Inspection Tasks	Weed checks in early season until crop is established. Young corn - inspects whorl, base of leaves for mites. Mature corn - inspects silks, uses hand lens, looks at "hidden" ears, examines wrapper leaves, only pulls an ear if damage is visible.
% time in field with foliar contact to body region	100% to total body. Scouts wear outer shirt, paper mask, goggles and hat due fungus, pollen and pesticide residues.
Typical pesticides	Methomyl, 4-6 x per year at full rate; parathion several times near harvest, oxydemeton-methyl, cyfluthrin, propargite, bifenthrin. Apps from May – Oct. Aerial apps every 3-4 days in the last couple of weeks before harvest.
Typical pests	Corn ear worm moth/worms, mites, aphids

Grapes

Inspection Season	Feb. - harvest
Frequency	25-30 inspections- weekly until August, then monthly with less dermal contact
Inspection duration/field	45-60 min spring-harvest, 10-15 min fall/winter
Fields per day inspected	7-10, in 4 spots per vineyard
Inspection Tasks	Visual and hand inspection of leaves and bunches, hand lens examination of leaves, soil; sampling of fruit for sugar content and petioles for nutrient status (100-150 petioles/sample).
% time in field with foliar contact to body region	Young vines, 5% contact to hands only. Mature vines, 10-25% contact with hands to elbow. No leg contact.
Typical pesticides	Sulfur applied 5 x per season; wettable every 21-28 days, dust alone within 14 days of spray. Bt, triflumazole, azoxystrobin, imidacloprid, myclobutanil each used once per season.
Typical pests	Powdery mildew, leaf rollers and folders, leaf hopper, thrips, mites, worms, phylloxera, botrytis, rot

### Peaches, Pluots

Control thresholds are very strict; fruit is rejected if 2% has worms. Scouts check leaf and fruit for overall vigor, disease, bugs, and weeds.

Inspection Season	March – Oct.
Frequency	1-2 x per month
Inspection duration/field	No information collected
Fields per day inspected	No information collected
Inspection Tasks	Early season, visual checks for insects. In summer, check leaves of 10-20 trees more closely, checks 20-30 fruits per field each inspection May-harvest; take petiole or leaf samples. Pre-harvest, when sugar content is high, inspect for diseases, rot. Post-harvest checks for vigor, weeds.
% time in field with foliar contact to body region	10-20% hands only
Typical pesticides	Esfenvalerate; paraquat for weeds. Most orchards were not treated.
Typical pests	Worms, scale, aphids, mites, botrytis, sow thistle, grasses

### Processing Tomatoes

By late June-harvest, foliage generally covers the furrow. By August/September, some unharvested fields have had the foliage thrown back over the bed so the furrows are clear.

Inspection Season	April-June, visual check for weeds. Overall, weed checks occupy 10-15% of the inspections. June-harvest, walking fields and hand inspections.
Frequency	April-June, 2 x per month. June – harvest, weekly.
Inspection duration/field	April-June, 5-10 min, June – Sept., 10-30 min, Sept.-harvest, 5-10 min.
Fields per day inspected	June-harvest, 6-12 (harvest is July – Oct. so fields dwindle)
Inspection Tasks	Visual inspections while walking, lifting and shaking plants from below, leaf inspection, petiole sampling. May cut open fruits.
% time in field with foliar contact to body region	April – June, < 10% hand contact, < 50% leg contact. Mid-June-harvest, 100% contact with leg below knee. Mid-June to mid-Sept, 50% contact, hands to above elbow. Mid-Sept.-harvest, 20% contact, hands to above elbow.
Typical pesticides	Sulfur periodically throughout season, plant growth regulator 1-2 x per season (June, July); 1-3 of the following may be applied once each: dimethoate, cypermethrin, esfenvalerate, myclobutanil, and tebufenozide.
Typical pests	Army worm, fruit worm, aphids, flea beetle



### Squash, pumpkins

Inspection Season	
Frequency	2 x per week to 1 x per month
Inspection duration/field	5-10 min in 4-5 spots per field (avg total of 25-45 min/field)
Fields per day inspected	4-6
Inspection Tasks	Visual and hand inspection. For sweep nets, take 10 180° sweeps in 5 spots; check beneficials vs. pests. May sample leaves, check traps.
% time in field with foliar contact to body region	July-harvest, 100% with lower leg. Sweeps only, no hand contact. Hand inspection – 25% to whole arm, hands.
Typical pesticides	Unknown – no treatments this year in observed fields
Typical pests	Insects

### Walnuts/Almonds

Pheromone traps are commonly used in both crops. Traps are mounted in the trees and it generally takes about 15 minutes to check all the traps in an orchard. Scouts may use binoculars to inspect the treetops.

Inspection Season	Feb. – harvest, winter checks for scale, disease if rainy. Pheromone traps set in March for peach twig borer.
Frequency	<b>Almonds:</b> 25-30 inspections- weekly April-harvest, then monthly with less dermal contact. <b>Walnuts:</b> 1-2 x per month until leaf fall.
Inspection duration/field	45-60 min spring-harvest, 10-15 min fall/winter
Fields per day inspected	8-12 orchards, with 4 stops (quadrants) inspected per orchard at 5-20 min/stop
Inspection Tasks	Check traps, walk rows, pull and inspect 50-80 leaves per field, pull, cut and inspect 40-80 hulls per field, collect hull, petiole (50-150/sample) or soil samples.
% time in field with foliar contact to body region	10% contact with hands only; hand examine 10-20 trees per stop (quadrant)
Typical pesticides	Propargite on foliage, glyphosate to weeds between trees
Typical pests	Weeds, disease, mites, worms, red-humped caterpillar, codling moth, peach twig borer

Watermelon

Crop is picked 2-5 times. Hives are always present, as pollination is continuous throughout season. The necessity of protecting the bees dictates that only low-toxicity pesticides are used. Tractor row is every 7 rows, beds are covered with plastic, and drip irrigation is used.

Inspection Season	June – Oct.
Frequency	Weekly
Inspection duration/field	10-20 minutes
Fields per day inspected	Up to 5-6
Inspection Tasks	Walk entire field in July, spot check Aug – harvest. Check traps, shake plants, hand lens examination of leaves. May take petiole samples.
% time in field with foliar contact to body region	July – Sept. 100% contact with lower leg below knee; 20-30% contact with hands and forearms.
Typical pesticides	Abamectin, Bt - can't apply anything that would harm bees
Typical pests	Cabbage looper, yellow striped army worm, aphids, mites